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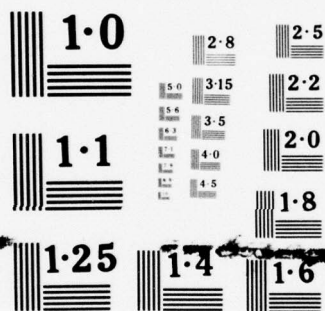
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DEFENSE SYSTEMS MANAGEMENT COLLEGE



PROGRAM MANAGEMENT COURSE INDIVIDUAL STUDY PROGRAM

COMMERCIAL EQUIPMENT:
STRETCHING THE DEFENSE DOLLAR

STUDY PROJECT REPORT
PMC 77-2

Thomas J. Michelli
GS-13 DAC

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DEFENSE SYSTEMS MANAGEMENT COLLEGE

STUDY TITLE: COMMERCIAL EQUIPMENT: STRETCHING THE DEFENSE DOLLAR

STUDY PROJECT GOALS:

To provide a digest of commercial equipment acquisition programs and regulations, to illustrate the benefits and recent acquisitions, and to evaluate, and hopefully influence, the current trends in materiel acquisitions.

STUDY REPORT ABSTRACT:

This report provides an analysis of the increasing role of commercial equipment within the Department of Defense (DOD) in the weapons system acquisition process. The report answers the question "Why Commercial?" and highlights the benefits of off-the-shelf procurements. It also provides a summary of existing DOD commercial equipment programs and regulations. Specific examples of current and planned commercial acquisitions are provided for both strategic and tactical applications. The report concludes with how DOD can further enhance its commercial acquisition posture.

SUBJECT DESCRIPTORS:

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COMMERCIAL EQUIPMENT:
STRETCHING THE DEFENSE DOLLAR

Individual Study Program
Study Project Report
Prepared as a Formal Report

Defense Systems Management College
Program Management Course
Class 77-2

by

Thomas J. Michelli
GS-13 DAC

November 1977

Study Project Advisor
Mr. George R. McAleer

This study project report represents the views, conclusions and recommendations of the author and does not necessarily reflect the official opinion of the Defense Systems Management College or the Department of Defense.

EXECUTIVE SUMMARY

This report provides an analysis of the increasing role of commercial equipment within the Department of Defense (DOD) in the weapons system acquisition process. It was found that:

(1) Greater use of commercial equipment can significantly improve the cost, schedule and performance of a weapons system.

(2) The overall cost of ownership of these systems can be reduced through better use of warranty service and, as a minimum, contractor repair of subsystem modules.

(3) The availability of established commercial field service will allow the Government more options in optimizing its maintenance support concepts and overall acquisition strategy. This includes cost/risk trade-offs in fielding basically similar systems of different manufacture.

An analysis of the basic acquisition regulations within DOD indicated that, with the exception of the Army, DOD has not adequately emphasized the need to consider commercial commodities in satisfying new materiel requirements. Recently, however, DOD has initiated the Commercial Commodity Acquisition Program (CCAP) aimed at significantly increasing the percentage of materiel requirements which are satisfied from the commercial marketplace. Several of the CCAP projects are discussed in this report.

Finally, the report discusses some of the pitfalls which have impeded the growth of commercial equipment within DOD. The most significant of these has been tendency to be too technically creative and to "customize" equipment for each new requirement. In doing so, have often lost sight of the basic user requirements and have allowed desired features to become the system

drivers instead of the trade-off factors. The basic thrust of OMB Circular A-109 and DOD Directives 5000.1 and 5000.2 are aimed at focusing back on the basic user needs. With this philosophy applied to all system acquisitions, commercial equipment will undoubtedly become more prevalent within DOD in the future. Savings which accrue through greater use of commercial equipment will help insure that DOD has the dollars required for its other necessary tasks.

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INTRODUCTION

PURPOSE OF THE REPORT

This report presents the findings of a research project conducted in fulfillment of the Individual Study Program requirements of the Defense Systems Management College. The purpose of this research project was to enhance my awareness and the awareness of the DOD acquisition community of the requirements for and benefits of acquiring commercial equipment to satisfy materiel needs.

SCOPE OF THE REPORT

Three specific research objectives were established to bound the scope of this project:

- (1) To provide a digest of commercial equipment acquisition programs and regulations within DOD.
- (2) To illustrate the benefits and some specific applications by the Services.
- (3) To evaluate, and hopefully influence, the current trends in DOD materiel acquisition.

RESEARCH METHODOLOGY

The research effort was structured into two major areas:

First, a survey was conducted of the literature and regulations pertaining to commercial equipment applications in DOD through the Defense Systems Management College library. This provided background information of past programs and the basic DOD and Service guidance provided to the acquisition

community.

Second, data was collected via telephone and personal interviews with representatives of OSD, the three Services and GAO to provide recent information on specific current and planned commercial equipment acquisition efforts.

REPORT STRUCTURE

Part I of this report answers the question "Why Commercial?" and highlights the benefits of off-the-shelf procurements. Part II provides a summary of existing DOD and Service commercial equipment programs and regulations which are in existence today. Part III contains specific examples of current and planned commercial acquisitions for both strategic and tactical applications. Finally, some thoughts on how DOD can further enhance our commercial acquisition posture are provided in Part IV.

PART I: WHY COMMERCIAL?

The answer is simple!

TO SHORTEN SCHEDULE

TO REDUCE COST

TO ENHANCE PERFORMANCE AND EFFECTIVENESS

At first glance, the first premise probably appears obvious; the second, questionable; and the third, unrealistic. Actually, each has subtleties and require a closer examination.

SCHEDULE

The first advantage of commercial equipment employment is a shorter acquisition schedule. By utilizing equipment which is "off-the-shelf", either directly or with modification, a significant reduction in the time it takes to field a new system can be achieved. Some small amount of Research and Development (R&D) effort may be required to develop and validate system concepts, but the time required should be minimal since equipment is readily available for test and evaluation. Upon completion of this accelerated concept formulation/validation phase, the system can move directly into production without entering the costly and time consuming full-scale engineering development process.

In production as well, a shorter schedule can be expected than that which is experienced with a newly developed system. The production line is generally in operation, and the problem reduces to nothing more than the size of the backlog in relation to the production capacity available. In some instances, immediate production delivery may even be available directly from the manufacturer's or the distributor's inventory.

It is also worth noting that a lengthy development process often feeds upon itself and further delays the fielding of a system. A major factor contributing to this is changing user requirements. The longer the system is in development, the greater the opportunity for the user to impose his influence to change the system. These changes often result in delays in system deployment, with the user being the most vocal malcontent.

The shortened schedule resulting from commercial equipment application can significantly reduce the opportunity for changing requirements to delay the deployment. In addition, procurement of a small quantity of units for

operational test and evaluation can be utilized to obtain the user's inputs prior to full procurement. This procedure was utilized by The Air Force in a recent procurement of video tape recorders. Details of this acquisition will be discussed in Part III.

COST

The next advantage of commercial equipment employment is lower acquisition cost. By utilizing equipment which is "off-the-shelf", either directly or with modifications, DOD can significantly reduce or eliminate its R&D expense.

The procurement cost should also be substantially lower than if DOD had progressed through the development route. Two major factors contribute to these lower production costs. First, there is usually a large commercial production base upon which we can "piggy-back" our demand. Here DOD can take advantage of the more mature learning and larger component discounting than would be available to smaller military product base. Secondly, there would be no large initial start-up costs for non-recurring items such as tooling and special production equipment. These costs would be pro-rated on a per unit basis and, therefore, shared by all customers in an equal proportion to their individual demands. (1)

While lower acquisition cost is an area of considerable savings, and one which would likely go unchallenged, it is not where the real money is to be saved. Operating and support costs of military equipment account for well over half of the total life cycle costs, and it is here, without a doubt, that the defense systems manager must insure that savings will accrue. It might be argued that this is where the fragile commercial hardware, procured

without the benefit of extensive documentation and fielded without months of extensive maintenance training will have its true day in court.

There is no question that the trial of commercial equipment begins here, but the verdict might catch many by surprise. Commercial product reliability, availability and maintainability (RAM) can in most cases match or exceed those of specifically designed military equipments. (An exception, naturally, in reliability, is where extensive exposure to certain environmental conditions dictate a special design.)

RAM is one of the major drivers in the cost of ownership of a system. Reliability will be discussed further when equipment performance is addressed. For now, it is only necessary to recall the reliability of our basic telephone instrument to appreciate the ruggedness commercial equipment can attain. Availability and maintainability can be particularly enhanced and provide significant O&S cost savings via the application of commercial equipment and commercial-type support.

An area where considerable savings can accrue is in the Government's use of warranties in the maintenance support concepts. There is no valid reason why the Government should not take advantage of the service support we have come to expect on our household products. Commercial manufacturers build in projected warranty costs into their price structure and it is foolish, if not criminal, for the Government not to utilize this service to its maximum effectiveness.

In the past bureaucrats have argued that administrative procedures make it difficult for Government agencies to take advantage of warranties. The complexity of procedures related to shipping, property accounting, identifying responsibility for malfunctions and other problems introduced such extensive

delays that warranties expired before use. In addition, very often equipment which was produced for Government inventory had its warranty expire prior to being placed into service. (2)

In 1975 the General Accounting Office (GAO) issued a report to Congress criticizing DOD and GSA for not obtaining full benefits available through truck warranties. GAO pointed out that the US Postal Service was able to recover about \$2 million annually through billback agreements. These agreements allow the Government to make warranted repairs and obtain reimbursements from the manufacturers when it is impracticable to return the item to an authorized service location. (3)

A Defense Science Board Task Force recently examined the subject of warranties as related to Electronic Test Equipment (ETE). They found that the Services frequently rely on their quality assurance systems to insure that ETE is delivered free of defects. Interestingly, when employing the inspection clause for fixed price contracts (ASPR 7-103.5) the Government expressly excludes warranties, since the clause states:

Except as otherwise provided in this contract, acceptance shall be conclusive except as regards latent defects, fraud or such gross mistakes as to amount to fraud. (4)

The Task Force found that the inspections called for in the contract were costly to implement. In addition, there was now the expense of providing in-house repair service for what could have been obtained without charge from the manufacturers. The Task Force estimated that failure to utilize available warranty service costs the Government at least \$3 million a year in the ETE area alone! Surprisingly the manufacturers are upset with this situation, too. They are loosing out on valuable feedback that the warranty process provides to enable them to analyze failure trends and implement corrective action.

Another key area ripe for O&S cost savings is the maintenance support beyond the warranty period. Here several options are available ranging from the manufacturer's on-site maintenance and factory overhaul to full military on-site and depot support. Each alternative has varying degrees of cost and risk to the Government which must be traded-off on a case-by-case basis. In general, however, turning over the total maintenance responsibility to the manufacturer should provide acceptable service at a very reasonable cost. The contractor can spread the cost of his training, repair equipment and facilities and spare parts inventory over his large commercial/Government product base. On the other hand, full dependency on a contractor raises the risk of not getting timely support or, worse yet, no support at all if he goes out of business. The other extreme, total military support is very costly and probably not affordable in most situations. This is particularly true with today's complex equipments and high military personnel turnover. There is no doubt that the most economical maintenance concept is the one which minimizes the number of people required, whether they be contractor or government personnel. Greater use of operator implemented diagnostic techniques is the key to the solution.

An interesting adaptation of this maintenance concept is being employed in the commercial telecommunications industry. Here, operator controlled built-in test equipment (BITE) and computer-aided diagnostics are utilized to pin-point problems down to a bad printed circuit module. The module is then replaced with an on-site spare and returned to the factory for repair. One manufacturer, Northern Telecom Inc., has a flat repair charge of \$110 a module and includes returning to the customer a module of the latest vintage. At this price we can't even begin to consider depot repairs. Many

well designed electronic systems have several common modules so the stocking problem is minimal and manufacturers will often drop-ship a replacement with only a telephone request.

This maintenance concept has a very subtle, but extremely important impact on DOD acquisition. For very large production buys it is highly desirable to have at least two sources of supply. In the past, this has required the Government to purchase a costly total reprocurment package, and in some cases, then pay to develop a production capability with another contractor. It might first appear that this requirement for two sources could prohibit the Government from taking advantage of the cost savings achievable if commercial equipment can indeed satisfy our needs. Certainly the Government can't expect commercial manufacturers to sell it production rights to set up a competitor in the marketplace. DOD might be able to procure acceptable equipment from two manufacturers, but who would think of supporting two completely different systems to do the same job? TODAY WE CAN AND COST-EFFECTIVELY, TOO! With manufacturer maintenance support as just described DOD can effectively and efficiently field systems produced by at least two contractors to perform equivalent functions. The added expenditure required for the minimal additional spares and training required for duplicate systems will be far outweighed by the advantage of maintaining a competitive posture for each successive production buy.

An example where this implementation strategy is being considered is within the US Army Communications Command (USACC). In the next few years USACC will embark on a massive program to replace the aging dial central offices (DCO's) which provide administrative telephone service to Army posts, camps and stations. There are some 400 installations under consideration

and commercial equipment can, without question, satisfy the requirement. Phase-in of the new systems will most likely be spread over a period of 10-20 years, and therefore, several individual or even multi-year procurements will be required. Utilizing the joint Government/contractor maintenance concept described, the Government can maintain adequate competition at a minimum cost. The additional cost of supporting two or three DCO types of different manufacture (estimated at 2-3% of a 20-year life cycle cost (5)) is insignificant compared with the overall cost, schedule and performance risk of getting into bed with a single contractor for the total procurement and support.

PERFORMANCE

Earlier it was stated that one of the advantages of commercial equipment was to enhance system performance and effectiveness. Initially this may seem contrary to the normal understanding of commercial equipment applications. It has generally been the belief that in selecting commercial equipment, system performance and effectiveness are areas which must be sacrificed in lieu of the schedule and cost advantages. While this may sometimes be the case, it is far from being unequivocally true.

The most significant factor contributing to the performance advantage of commercial equipment is the rapidly moving frontiers of today's technology. When the Government embarks on a long development program in many cases it ends up fielding equipment which is far behind the current commercial technology in capability and cost-effectiveness. By acquiring off-the-shelf equipment the Government can field a state-of-the-art system years before the developed item. This improved capability and accelerated fielding combine

to give the user a significant advantage over the development acquisition route.

Consider, for example, the AN/TTC-39 telephone communications system being developed by the Tri-Service Tactical Communications (TRI-TAC) Office. In 1971, a TRI-TAC representative testified before a House Armed Services Subcommittee that this system would be developed, tested and deployed within four years (6). Today the system is still in development and almost a year away from Government testing. During this time substantial progress has been made by the commercial telecommunications industry which far out-shines the "advanced" capability promised to the users many years ago.

This is a good example of a piece of equipment which could have been procured as a modified commercial item. The primary functions of a telephone communication system are not unique for military requirements. The few specialized functions such as communications security could have been added to a good off-the-shelf product and the equipment would have been in the hands of users today!

The reliability of a system is a key factor in determining its overall performance and effectiveness. The reliability of much commercial equipment is already very high. As mentioned earlier, consider the household telephone. In this case the imposition of incentives upon the manufacturer improved the reliability. The large telephone companies like AT&T and GTE have manufacturing subsidiaries which provide the products to the operating subsidiaries. Increased reliability means more profits to the overall company through lower O&S costs and this provides the motivation to the manufacturers to design-in lower life-cycle cost. The Government can provide similar incentives to its suppliers through Reliability Improvement Warranties (RIW). Here, the

contractor becomes a partner in the life cycle cost arena and both the contractor and Government benefit by striving to drive these costs down.

PART II: DOD COMMERCIAL EQUIPMENT PROGRAMS AND REGULATIONS

The objective of this section was to highlight the various DOD and Service commercial equipment programs and regulations to guide the systems acquisition manager to the sources of information and direction which are available. At present there are no DOD or Service regulations which deal exclusively with commercial equipment acquisition. However, the basic acquisition regulations of the Army and Air Force, AR 1000-1 and AFR 800-3 respectively, do explicitly state that commercial equipment must be considered prior to a decision to pursue a R&D effort. The Navy does not have any such guidance in their regulations at this time. The Marine Corps Systems Acquisition Management Manual, MCO P5000.10 identifies commercial equipment as an acquisition alternative, but does not prioritize its consideration.

It should be noted that AR 1000-1 addresses the issue of commercial equipment in its first paragraph, while the topic is buried in the bowels of the other documents wherein much of the thrust is lost. It appears that commercial equipment acquisition will not be given adequate emphasis by all Services until a specific DOD directive is issued. Fortunately, DOD is moving in this direction.

DOD

The current DOD thrust in the acquisition of commercial equipment is contained in the Commercial Commodity Acquisition Program (CCAP). The

program was initiated in a 30 December 1975 letter to the Services which announced the establishment of "... a formalized program to emphasize the routine consideration of the procurement of commercial materials, parts and end items of equipment to satisfy Defense requirements..." (7). On 14 January 1977 the CAPP Pilot Program was initiated in order to evaluate various military applications of commercial equipment prior to the issuance of a specific DOD policy directive (8). Included in this pilot effort are some 40 different products under procurement by the Services, a few of which are discussed in Part III, Recent and Planned Commercial Equipment Acquisitions.

ARMY

The most significant Army commercial equipment program is MACI, Military Adaptation of Commercial Items. The objective of MACI is to satisfy military requirements in the shortest time and at the least cost by utilizing an item which is currently available from a commercial source. The MACI program is defined in AR 700-90. MACI funds are available to procure, evaluate, test, type classify, and if necessary, modify commercial equipment.

A specific MACI program which has been extremely successful is the Commercial Construction Equipment (CCE) Program. This program, started in 1969, has resulted in the procurement of at least 18 types of major construction equipment from commercial sources. This program is also discussed in greater detail in Part III.

NAVY

The Navy, under its TELCAM program-Telecommunications Equipment Low Cost Acquisition Methods is evaluating the capability of commercial

electronics equipment to meet shipboard requirements. The results to date confirm that commercial products can perform in the real world military environment, and dramatic cost savings can be achieved through their greater use (9). In fact, the Navy has found that the ratio of the cost of some militarized equipment to satisfactory commercial equipment has approached. (50:1) In one application, for example, an \$8000 militarized cassette tape recorder was replaced with a \$167 commercial unit. (10)

AIR FORCE

Prior to 1977 the Air Force did not have a specific commercial equipment program, however, it was extremely responsive to the DOD CCAP effort. Within three months after DOD established the Pilot Program the Air Force identified and documented five ongoing efforts for inclusion in the Program. Two of the efforts, the Security Police Armored Response/Convoy Vehicle and the Airborne Video Tape Recorder (VTR), are described further in Part III.

PART III: RECENT AND PLANNED COMMERCIAL EQUIPMENT ACQUISITIONS

There are many recent and planned commercial equipment acquisitions which illustrate some of the concepts that have been discussed. The following projects indicate the broad base of requirements, strategic as well as tactical and ground as well as airborne, which are being satisfied by commercial equipments.

TELECOMMUNICATIONS AND DATA PROCESSING

Two extremely lucrative areas for the application of commercial

equipment within DOD are telecommunications and data processing. They are discussed here together because the more significant telecommunications systems are, as with data processing systems, developed around stored-program processors, more commonly referred to as computers.

The large majority of strategic and administrative telecommunications and data processing services provided by the Army, Navy and Air Force are supplied through, leased or government owned commercial systems. This should be of little surprise since these systems operate predominately in a fixed plant environment identical to those in the commercial sector. While the procurements here are relatively straightforward, there is still substantial room for innovative acquisition techniques to further reduce life cycle cost. Techniques such as better use of warranty provisions, RIW and contractor maintenance support are only a few examples. In particular, the Government should strive to maintain continued competition for each successive procurement, and as discussed in Part I, this can best be accomplished if the systems have sophisticated diagnostic capability and contractor repair of modules.

The area where DOD must concentrate its attention more is that of tactical systems acquisition. Traditionally, the DOD acquisition community has ignored commercial equipment potential here due to the severe environmental requirements. For many of the systems today, this is no longer true! In particular, for those applications which require operator personnel, most commercial equipment can certainly withstand the operating environment. The problem area is basically in being able to survive transport which is unquestionably more severe than the commercial industry designers anticipated. This is, however, a relatively simple problem to solve. The current hardware technology of the telecommunications and data processing industries is pre-

predominately Large Scale Integration (LSI) and the construction is modular in design. Minor repackaging, if required, and shock mounting should be all that is necessary for a shelter mounted transportable configuration.

This is exactly the approach being taken by the Army's Project Manager TACMIS (Tactical Management Information Systems) of the Computer Systems Command in their procurement of a Decentralized Automatic Service Support System (DAS₃). DAS₃ is a mobile logistics automated data processing system and "... will be employed in all types of geographical areas, climates and terrain in which Army units operate (11)." A draft specification has been prepared and distributed to industry for comment. Included right at the beginning of the specification is the following key statement:

All ADP equipment (proposed) must be in current production (i.e. equipment identical to that provided must have been manufactured within one (1) year prior to proposal due date), part of the original manufacturers' current commercial product line, and equipment provided must not be prototype equipment. Equipment which meets the above criteria but which must be modified to meet specific requirements of the specification is acceptable. (12)

A detailed analysis of alternative means of logistic support for the DAS₃ System was conducted by the US Army Electronics Command (13). Their analysis concluded that with the minimum 250 hour MTBF specified, and expected life of eight years and a density of 150 systems, total military support was the most cost-effective maintenance concept. It should be noted that no future procurements beyond the initial buy are contemplated and, therefore, the aspects of utilizing contractor support to make practicable future competition was not considered.

AVIONICS

The Air Force is currently in the process of procuring a commercial video tape recorder (VTR) to provide an on-board image recording capability during various flight missions. This program is particularly interesting because the Air Force first embarked on a R&D effort with competitive prototyping in 1974. The R&D effort was terminated, primarily for the reasons of cost (projected at \$7000 to \$9500 per unit) and time necessary to fully develop and acquire a new system. The total cost of the R&D effort was \$3.8 million. (14)

A market survey was conducted and revealed that a commercial VTR manufactured by TEAC, Ltd. in Japan had the best potential of satisfying the requirement at a cost of \$1500 per unit. Several units were procured and were used in over 1200 sorties with excellent results. As a result of this evaluation, the Air Force identified several minor modifications to improve performance. The cost of retrofitting the delivered items with these modifications (approximately \$100 and three hours per unit) was absorbed by the contractor. These modifications have raised the MTBF from 157 to 292 hours.

The current plan is to procure about 2300 VTR units, thus the Air Force has saved from \$12.6 to \$18.4 million in acquisition cost by switching to a commercial item. The logistic support concept will be Air Force maintenance since TEAC does not have a sufficient network of service outlets for contractor support at this time.

VEHICLES

The Army has recently awarded a multi-year contract for approximately 600 commercial trucks of various sizes and configurations. The first year

increment was \$51 million. The solicitation package was somewhat unique in that each vehicle class was specified with only two parameters, such as:

Truck Tractor, 6 x 4, 55000 GVWR

Truck Tractor, 8 x 6, 75000 GVWR

However, the Government did provide a 30 page questionnaire for each vehicle class which had to be completed as the technical proposal. The questionnaire asked for detailed performance data covering all aspects of the power train, chassis, cab and related equipment. The contracting method was a Two-Step IFB.

The contract includes a warranty provision which provides for a period of 15 months or 12,000 miles in addition to an allowable storage time of up to six months. In obtaining corrective action, the Government has the option to return the vehicles to the contractor's plant or dealer or to correct the units itself. In the latter case the contractor would be billed for the labor based upon prevailing rates.

The Air Force currently has a requirement from the Air Force Security Police to acquire armored response/convoy vehicles. It is the Air Force's intention to acquire a vehicle that is either commercially available or comprised largely of commercial components. A market survey was undertaken and several domestic vehicles sold on the open market have been identified as potential candidates. The current requirement is for 461 vehicles and the estimated unit cost is \$30,000. (15)

CONSTRUCTION EQUIPMENT

In 1969, the Army established a policy to equip its construction units with Commercial Construction Equipment (CCE). The objectives of the CCE

effort were to eliminate the need for R&D, shorten the procurement time, increase the availability of spare parts and reduce overall cost. Initially, three pilot items were procured for test and evaluation; a 20 ton dump truck, liquid asphalt sprayer and truck-mounted crane. To date, about twenty different types of CCE have been procured. While no specific savings estimates have been made on the total program it is expected to be in the hundreds of millions of dollars. On two particular procurements for the T-11 Crawler Tractor and the 4 1/2-5 Cubic Yard Scoop Loader the Army estimated a cost savings of \$29 million from personnel reductions over the life span of these items. Much of the savings is the result of improved warranty service (15 months and 6 months storage) and greater utilization of the contractors' service centers in both CONUS and overseas.

Equipment selected for the CCE program is limited to those which have been in general use by the civilian industry in essentially the same configuration and where sufficient data has been collected from manufacturers, trade organizations and users to establish that the item is an industrially acceptable product. When a new requirement is generated, a survey team visits potential contractors and current users of the required equipment to assess the equipment acceptability. In some cases sample units are rented to better assess the military utility of the equipment.

It is interesting to note that a rather unique concept has been incorporated in the CCE acquisition strategy. In some of the contracts the manufacturers have agreed to buy-back arrangements when the Government decides to replace the items. In effect the Government is getting a guaranteed trade-in value for its equipment which should eliminate the costly disposal process and may make it more cost-effective to replace the equipment at more

frequent intervals.

While much of the CCE program has been a flag-waving success, the GAO did criticize the Army in 1975 for not shortening the procurement time as much as possible. The Army had taken from 28 to 48 months in moving from requirements definition to full-scale procurement, with the largest "unproductive" time in the requirements validation phase. This is not unusual in other commercial equipment programs, and GAO's specific comments on CCE are applicable across the board:

We recognize that choosing a piece of equipment to fulfill worldwide needs involves many decisions and that the risk of investing considerable funds in equipment which either will not last or will not do the intended job should not be taken lightly. We believe, however, that unnecessary delay of commercial equipment procurement can result in rising prices due to inflationary factors, continued repairs to equipment scheduled for replacement, and postponing potential personnel savings.

We believe that increased attention to prompt processing, alertness for possible bottlenecks, and a possible streamlining of the approval process, with particular attention to the requirement validation phase, would shorten the time it takes to procure commercial construction equipment. (16)

PART IV: ONLY A STEP IN THE RIGHT DIRECTION

There is no question that DOD is beginning to make great strides in stretching our defense dollars through increased acquisition of commercial items. It has, however, only addressed the "tip of the iceberg". DOD must

take a closer look at all new requirements, and it must also scrupulously examine those systems in development to see if it can "cut the losses" before it's too late. This applies not only to our non-major systems, but to our major systems as well. The AN/TTC-39 telephone communications system, as discussed earlier, is a major system which might well have been satisfied by a shelterized, modified commercial telephone system. It's still not too late!! Production cost estimates are currently over ten times that of a commercial system performing the same basic function, even without the costly communications security equipment. There is, without a doubt, a large margin for savings even after the cost of modifying and shelterizing a commercial system.

Opponents are quick to argue that programs like the AN/TTC-39 only appear on the surface to be satisfiable by off-the-shelf products. A closer examination, they say, reveals special requirements such as interfaces with wide assortments of other systems and special features and functions, which make modification of off-the-shelf products not cost-effective. This may very well be true in some cases, however, a closer examination of those requirements just might uncover only very weak ties between those special features and the basic materiel need of the user. These weak ties should become tradeoff areas, not drivers, in selecting the system concept and acquisition strategy. This is the basic thrust of OMB Circular A-109 and DOD Directives 5000.1 and 5000.2. The requirement for a new major system is stated in a Mission Element Needs Statement (MENS) in terms of the mission element tasks to be performed rather than specific capability or system requirements. The alternatives, including commercial equipment applicability, can then be fairly assessed in terms of cost, schedule and performance in

meeting that need. Through this process it is anticipated that greater use of commercial items is almost a certainty in the future.

Unfortunately, A-109, 5000.1 and 5000.2 apply only to major systems. It is hoped that the Services apply the appropriate concepts conveyed in these documents to non-major systems as well to insure that all system tradeoffs are performed against the user's materiel need.

DOD must also work much closer with the commercial equipment industry during its planning phases to insure that they are aware of our future requirements. If DOD anticipates a need for a system which has potential value in the marketplace, it must insure that this is conveyed to the appropriate industry in sufficient time for their long range planning and internal development process. This can be accomplished in many ways ranging from the Technology Coordinating Papers and Technical Area Descriptions down to informal dialogs with industry in a "brainstorming" session. Industry will welcome these inputs to aid them in assessing their market and establishing priorities for the best use of their limited resources.

CONCLUSIONS

This report has only scratched the surface of an extremely fertile area for stretching the defense dollar. Nevertheless, the following key issues are readily apparent:

(1) Greater use of commercial equipment can significantly improve the cost, schedule and performance of a weapons system.

(2) The overall cost of ownership of these systems can be reduced through better use of warranty service and, as a minimum, contractor repair of subsystem modules.

(3) The availability of established commercial field service will allow the Government more options in optimizing its maintenance support concepts and overall acquisition strategy. This includes cost/risk tradeoffs in fielding basically similar systems of different manufacture.

The most urgent concern today should be to increase the awareness of the DOD acquisition community of the advantages of off-the-shelf procurements. The CCAP effort should pave the way to a clear and forceful DOD policy in the near future. In particular commercial equipment consideration should become a routine DSARC/SSARC issue.

Finally, DOD must insure that it doesn't oversell a good concept. It is not the intent to force DOD to operate out of a Sears-Roebuck catalogue. There is no question that many materiel needs require the development of a totally new system. However, insuring that this is not done when commercial products can handle the job will help insure DOD has the dollars it needs for the other necessary tasks.

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